TRANSLATION

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Form PCT/IPEA/416
04-F-051PCT		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/JP2004/017313	15.11.2004	15.11.2003

International Patent Classification (IPC) or national classification and IPC

G03F7/004, G03F7/38, G03F7/40, B82B3/00, G02B1/02

Applicant

NATIONAL INSTITUTE FOR MATERIALS SCIENCE

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

   a. ☒ *(sent to the applicant and to the International Bureau)* a total of 3 sheets, as follows:

      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s))

      _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/JP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/JP2004/017313

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

☐ international search (Rule 12.3 and 23.1(b))

☐ publication of the international application (Rule 12.4)

☐ international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ the international application as originally filed/furnished

☒ the description:

pages 1-8 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☒ the claims:

nos. 14 as originally filed/furnished

nos.* _____ as amended (together with any statement) under Article 19

nos.* 1-13 received by this Authority on 14.06.2005

nos.* _____ received by this Authority on _____

☒ the drawings:

sheets fig. 1-6 as originally filed/furnished

sheets* _____ received by this Authority on _____

sheets* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☐ the claims, nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/JP2004/017313

Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	2-4, 7-12, 14	YES
	Claims	1, 5, 6, 13	NO
Inventive step (IS)	Claims		YES
	Claims	1-14	NO
Industrial applicability (IA)	Claims	1-14	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Document 1: JP 2002-363209 A (Fuji Photo Film Co., Ltd.), 18 December 2002

Document 2: JP 2002-83688 A (JSR Corp.), 22 March 2002

Document 3: JP 8-22116 A (Kobe Steel, Ltd.), 23 January 1996

Claim 1

Document 1 (paragraphs [0222] to [0232]), document 2 (paragraphs [0081] to [0087]) and document 3 (paragraphs [0013] to [0021]) disclose pattern formation methods that comprise a step for irradiating light onto a photocurable resin that contains organic molecules (e.g. the "spectral sensitization pigment," the "organic boron compound" and the like disclosed in document 1; the "ultraviolet absorber" and the like disclosed in document 2; or the "ladder silicone-based SOG" and the like disclosed in document 3) in order to harden said photocurable resin in a prescribed pattern upon a substrate, and a step for eliminating the unhardened portions of said photocurable resin. Therein, it is apparent that the pattern formation methods disclosed in documents 1 to 3 affix the organic molecules that are present in the hardened portions of the photocurable

resin to the substrate in a prescribed pattern.

In addition, the organic molecules that are present in the photocurable resins disclosed in documents 1 to 3 do not react with said photocurable resins, and it is common for patterns that are formed from photocurable resins to have a micro/nano scale. Such being the case, the invention set forth in claim 1 lacks novelty and does not involve an inventive step.

Claims 2 to 4

Techniques for irradiating light upon a photocurable resin in a prescribed pattern wherein the irradiation light is focused light or a laser beam and said irradiation light is irradiated upon the photocurable resin through a mask pattern are commonly used in the technical field in question, and thus it would have been obvious to a person skilled in the art to configure so that light is irradiated upon the photocurable resins disclosed in documents 1 to 3 by means of the techniques in question. Such being the case, the invention set forth in claims 2 to 4 does not involve an inventive step.

Claim 5

The organic molecules present in the photocurable resins disclosed in documents 1 to 3 are clearly capable of absorbing the light that is irradiated thereupon; therefore, the invention set forth in claim 5 lacks novelty and does not involve an inventive step.

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Claim 6

Document 1 (paragraphs [0222] to [0232]), document 2 (paragraphs [0081] to [0087]) and document 3 (paragraphs [0013] to [0021]) disclose pattern formation methods that comprise a step for hardening a photocurable resin in a prescribed pattern by means of irradiation with light, and a step for bringing the photocurable resin into contact with a developing solution that contains organic molecules.

When the photocurable resin is brought into contact with the developing solution, it is natural for the organic molecules that are present in the developing solution to penetrate into the photocurable resin, and the organic molecules that are present in the developing solutions disclosed in documents 1 to 3 do not react with the photocurable resin. Furthermore, it is common for patterns that are formed from photocurable resins to have a micro/nano scale. Such being the case, the invention set forth in claim 6 lacks novelty and does not involve an inventive step.

Claim 7

The technique for bringing a photocurable resin into contact with a developing solution by immersing the photocurable resin within the developing solution is commonly used in the technical field in question. Such being the case, the feature wherein the photocurable resins disclosed in documents 1 to 3 are brought into contact with a developing solution by means of the technique in question cannot be found to involve an inventive step.

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Claims 8 to 11

Techniques for irradiating light upon a photocurable resin in a prescribed pattern wherein the irradiation light is focused light or a laser beam, said light is irradiated upon the photocurable resin through a mask pattern, and the shape of the beam of focused light is used to control the shape of the hardened portion of the photocurable resin are commonly used in the technical field in question, and thus it would have been obvious to a person skilled in the art to configure so that light is irradiated upon the photocurable resins disclosed in documents 1 to 3 by means of the techniques in question. Such being the case, the invention set forth in claims 8 to 11 does not involve an inventive step.

Claim 12

A person skilled in the art could determine the appropriate number of repetitions of the pattern formation method in order to accommodate the number of colors that are necessary to form the pattern and the like. Therefore, modifying the pattern formation methods disclosed in documents 1 to 3 so that the pattern formation step is repeated a plurality of times in order to affix each of the plurality of types of organic molecules in different hardened portions of the photocurable resin cannot be found to involve an inventive step.

Claim 13

The organic molecules that are present in the photocurable resins disclosed in documents 1 to 3 are functional molecules; therefore, the invention set forth

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

in claim 13 lacks novelty and does not involve an inventive step.

Claim 14

Document 3 (paragraph [0001] and the like) suggests that articles with a pattern that was formed from a photopolymerizable resin can be used as micro/nano-scale articles. Therefore, the feature wherein the articles disclosed in document 3 are used as micro/nano-scale articles cannot be found to involve an inventive step.